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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,971	03/16/2001	Sheng Huang	10984.3US11	7444
23552	7590	11/25/2005	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			SIMITOSKI, MICHAEL J	
			ART UNIT	PAPER NUMBER
			2134	

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/810,971

Applicant(s)

HUANG ET AL.

Examiner

Michael J. Simitoski

Art Unit

2134

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12-31 and 34-45 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9, 12-31 and 34-45 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 16 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The response of 10/9/2005 was received and considered.
2. Claims 1-9, 12-31 & 34-45 are pending.

Response to Arguments

3. In light of Applicant's amendment, the rejections set forth in the previous Office Action are withdrawn.
4. Applicant's arguments with respect to claims 1-9, 12-31 & 34-35 have been considered but are moot in view of the new ground(s) of rejection.
5. Applicant's response (§I) suggests that Koltai fails to disclose "phase modulation" because Koltai only discloses the repositioning of a dot. Applicant further suggests that Koltai fails to disclose "embedding each latent image object into its respective watermark layer by phase modulation". As Applicant has pointed out, Koltai does disclose the repositioning or modulation of a dot. It is noted that the instant specification discloses phase modulation in Fig. 2, which is shown to be the repositioning of dots. While the Examiner believes that Koltai discloses phase modulation in Fig. 10, Koltai does not explicitly describe it as such. However, McGrew teaches that one secure method of watermarking is achieved by creating two dot patterns (either the same or opposite, for example) where when overlaid with each other, the resulting image is either the dot pattern (same) or solid (opposite pattern). One (message pattern) is phase modulated with respect to the original (reference pattern) so that when overlaid, a difference appears. It is in this difference that a watermark is encoded (col. 2, lines 8-27, 32-37 & col. 4, lines 30-43). Therefore, it would have been obvious to one having ordinary skill in the

art at the time the invention was made to create a reference pattern (decoder) and a message pattern (phase modulated pattern) for each layer of Koltai's watermarking scheme (for instance, each of the C, Y, M and K color layers) and superpose the message patterns (watermarked layers) together.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 6-9, 13-16, 20-26, 28-31, 35-38 & 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,104,812 to Koltai et al. (**Koltai**) in view of U.S. Patent 5,396,559 to **McGrew**.

Regarding claims 1-3, 7, 23-25 & 29, Koltai discloses determining a required plural number of watermark layers (Fig. 15) and a dot patterns/secondary images for each of the plurality of watermark layers, selecting at least one latent image object/secondary images for each of the plural of watermark layers (col. 4, lines 11-16) and embedding each latent image object/secondary images into its respective watermark layer (col. 4, lines 11-16), superposing the watermark layers to form the watermark/overall secondary image (col. 4, lines 40-44), defining and generating a decoder for each watermark layer (col. 4, lines 11-16) and applying the watermark to the document/primary image (col. 4, lines 11-16). Koltai lacks explicitly embedding each latent image object into its respective watermark layer by phase modulation and

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lacks the decoder matching the dot pattern of each corresponding watermark layer. However, McGrew teaches that one method of optical watermarking is to obtain two patterns, for example dot patterns where one is phase modulated with respect to the other (col. 2, lines 8-27 & lines 32-37). To the human eye, the patterns are identical, but the small modulations in the message pattern become visible when overlaid with the reference pattern (col. 4, lines 36-43). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to phase modulate each of the watermark layers of Koltai (Koltai, Fig. 15) with respect to a reference pattern/decoder, where the decoder matches the dot pattern of each corresponding watermark layer. One of ordinary skill in the art would have been motivated to perform such a modification to obtain a high level of security, as taught by McGrew (col. 2, lines 8-27, 32-37 & col. 4, lines 30-43).

Regarding claims 4 & 26, McGrew discloses the dot pattern/reference pattern being a linear coordinate mapping of a basic two-dimensional dot array (1:1) (col. 4, lines 36-43).

Regarding claims 6 & 28, McGrew discloses a random dot array (col. 3, lines 3-7).

Regarding claims 8-9 & 30-31, Koltai discloses the latent image objects containing information that is critical to the application (col. 11, lines 45-49).

Regarding claims 13 & 35, McGrew discloses a decoder/reference pattern (col. 4, lines 36-43) for each watermark layer (Koltai, Fig. 15) that has a decoder structure related to a dot pattern structure of a carrier dot pattern/dots of the relevant watermark layer (Koltai, Figs. 19A-19J) and in the direction where the latent image object is embedded (col. 4, lines 36-43).

Regarding claims 14 & 36, McGrew discloses a conjunct/reverse-contrast relationship (col. 4, lines 36-43).

Regarding claims 15 & 37, Koltai does not specifically disclose sufficient difference, however, as the watermark layers/secondary images are superimposed on the primary image to be later verified, it is inherent that the secondary images are of sufficient difference to avoid interference.

Regarding claims 16 & 38, Koltai discloses a difference between layers to avoid interference (col. 14, lines 47-51).

Regarding claims 20-22 & 43-45, Koltai discloses the watermarks being embedded into the various color channels (col. 14, line 46 – col. 15, line 10 & Fig. 15).

8. Claims 5 & 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koltai & McGrew**, as applied to claims 2 & 26 above, in view of U.S. Patent 4,828,644 to Ochoa et al. (**Ochoa**). Koltai discloses performing rotations (col. 4, lines 12-25), but lacks the dot pattern including a non-linear coordinate mapping of a basic two-dimensional dot array. However, Ochoa teaches that rotations are linear operations in polar coordinate space (col. 1, lines 23-46). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a non-linear coordinate mapping (polar) of a basic two-dimensional dot array. One of ordinary skill in the art would have been motivated to perform such a modification to perform linear operations resulting in a rotation, as taught by Ochoa (col. 1, lines 23-46).

9. Claims 12 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koltai & McGrew**, as applied to claims 11 & 33 above, in view of U.S. Patent 6,636,616 to **Harrington**. Koltai lacks smoothing to avoid abrupt changes. However, Harrington teaches that $W(x, y)$ (the

watermarking function) should smoothly transition from one value to another (in this case from – 1 to +1) to avoid abrupt visible transitions in the image (col. 5, lines 44-53). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a post-processing smoothing step. One of ordinary skill in the art would have been motivated to perform such a modification to avoid abrupt visible transitions in the image, as taught by Harrington (col. 5, lines 44-53).

10. Claims 17 & 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koltai & McGrew**, as applied to claims 13 & 35 above, in view of U.S. Patent 6,345,104 to **Rhoads**. Koltai discloses a counterfeit-proof layer (col. 15, lines 28-33), but lacks the decoder being a photocopier. However, Rhoads teaches that by including watermark verification features (decoder) into a photocopier, the copier can take action if reproduction of a security document is attempted (col. 3, lines 1-26). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the decoder in a photocopier. One of ordinary skill in the art would have been motivated to perform such a modification to take action if reproduction of a security document is attempted, as taught by Rhoads (col. 3, lines 1-26).

11. Claims 18 & 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koltai, McGrew & Rhoads**, as applied to claims 17 & 39 above, in view of U.S. Patent 5,767,889 to **Ackley**. Koltai, as modified above, lacks a post-processing step to remove dots that are too close to adjacent dots in a non-object area. However, Ackley teaches that it is useful to eliminate dots

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on bar code printer to ensure that the bars do not bleed into each other under certain printing conditions (col. 5, lines 43-67). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to remove dots that are too close to adjacent dots. One of ordinary skill in the art would have been motivated to perform such a modification so the dots to not bleed into each other during printing, as taught by Ackley (col. 5, lines 43-67).

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Koltai & McGrew**, as applied to claim 1 above, in view of U.S. Patent 5,659,613 to Copeland et al. (**Copeland**). Koltai discloses generating the watermark (Fig. 13), controlling the printing process to protect the document and the watermark from attack (col. 4, lines 35-40) and generating a decoder device to enable verification of the authenticity of the document (col. 8, lines 8-32 & col. 11, lines 26-34, col. 15, lines 28-34). Koltai lacks verifying the authenticity and copyright of the document before printing. However, Copeland teaches that to ensure legitimate use of a product, such as a DVD, the system searches for an authentication signature/watermark and will not play the disk if it isn't found (col. 1, lines 48-50 & col. 2, lines 35-56). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to verify the authenticity and copyright of the document before printing. One of ordinary skill in the art would have been motivated to perform such a modification to ensure legitimate use of the printed matter, as taught by Copeland (col. 1, lines 48-50 & col. 2, lines 35-56).

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13. Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koltai & McGrew**, as applied to claim 23 above, in view of “If One Watermark is Good, Are More Better?” by Mintzer et al. (**Mintzer**).

Regarding claim 41, Koltai discloses that the watermark being included in a document for protection (col. 15, lines 27-34), but not for authentication. However, Mintzer teaches that watermarks are often used to determine if an image has been altered (§1.2 ¶2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to also include information about the document, so as to provide authentication. One of ordinary skill in the art would have been motivated to perform such a modification to verify the content of the object, as taught by Mintzer (§1.2 ¶2).

Regarding claim 42, Koltai discloses watermarking a word (col. 15, lines 27-34).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference to Amidror is cited for teaching that the McGrew reference discloses phase modulation.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Simitoski whose telephone number is (571) 272-3841. The examiner can normally be reached on Monday - Thursday, 6:45 a.m. - 4:15 p.m.. The examiner can also be reached on alternate Fridays from 6:45 a.m. – 3:15 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Morse can be reached at (571) 272-3838.

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Any response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Or faxed to:

(571) 273-8300
(for formal communications intended for entry)

Or:

(571) 273-3841 (Examiner's fax, for informal or draft communications, please label "PROPOSED" or "DRAFT")

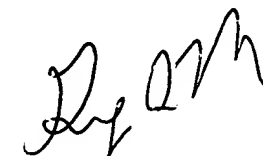
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MJS

November 14, 2005



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